Amendments to the Specification

A replacement specification is included with this Amendment in response to the objection in the Office action that the spacing made reading/OCR difficult. The replacement specification is double-spaced (as opposed to the original specification that had lines that are 1½ spaced). This replacement is done as a courtesy because of the difficulties encountered by the Office OCR equipment in this particular instance. The original specification complies with the requirements set forth in 37 CFR § 1.52(b)(2).

The following amendments are included in the replacement specification. All of the changes are supported by the application as originally filed and no new matter has been added. In the following markup, deleted text has been struck through, new text has been underlined. Page and line numbers refer to the originally-filed application.

The paragraph beginning on page 4, line 18 (corresponding to replaced page 5, line 14):

With reference to Fig. 3, a current mirror 420 comprises three NMOS transistors: a first NMOS transistor 422, a second NMOS transistor 424, and a third NMOS transistor 426. These three NMOS transistors are connected together to form a master current source and current mirror. The gates of three transistors are coupled together and to the drain of the first NMOS transistor 422. Therefore, the gates of transistors ~~424, 426, and 426~~ 422, 424, and 426 see the same voltage. The drain of the first transistor 422 is coupled to a resistor 430, the other terminal of the resistor 430 is coupled to a large voltage (V_{hv}) line 412 on which a small voltage signal is superimposed by a signal source 410 which is in series with a current source I_1. The drain of the second transistor ~~430~~ 424 is coupled to a second resistor 432 and the other terminal of the resistor 432 forms a common mode voltage V_{sense1}. Similarly, the drain of the third NMOS transistor 426

is coupled to a third resistor 434. The other end of the third resistor ~~426~~ 434 is coupled to a first terminal of an external sensing resistor R_{sense}~~,~~ 414~~,~~ and forms a common mode voltage V_{sense2}. The differential voltage V_{sense} is the voltage across the resistor 414. A current that flows through the resistor 430 is a reference current I_0. The other currents I_2 and I_3 flowing through resistors 432 and 434 respectively are the mirror of the reference current I_0. Resistors 430, 432 and 43 have equal resistance values, designated R_1, R_2 and R_3, respectively.

The paragraph beginning on page 5, line 11 (corresponding to replaced page 6, line 15):

In a preferred embodiment, a means for current-to-voltage conversion is an operational amplifier (op-amp) 440. Other means for current-to-voltage conversion may be used instead of the op-amp 440. The non-inverting input terminal of the op-amp 440 is coupled to the drain of the second transistor 424, and the inverting input is coupled to the drain of the third NMOS transistor 426. A fourth resistor 442 is a feedback resistor that connects its output terminal to the inverting input terminal of the op-amp 440. Non-inverting input terminal of the op-amp 440 is coupled to a fifth resistor 444 whose other end is coupled to a voltage reference Vref~~,~~ 446. The first DC terminal of the op-amp is coupled to a second voltage source V_{dd}~~,~~ 448~~,~~ which is the IC power supply. A second DC source of the op-amp 440 converts the unbalanced currents caused by the small signal voltage V_{sense} to a proportional voltage. Resistors ~~446~~ 442 and 444 have resistance valves designated as R_4 and R_5, respectively.

The paragraph beginning on page 6, line 16 (corresponding to replaced page 8, line 1):

With the connections specified above, first transistor 422 is a master current source that produces a ~~referent~~ reference current I_0. The ~~referent~~ reference current I_0 equals ~~to~~ $(V_{hv}-V_{gs}^{Q1})/R_1$. The master current source 422 also

causes mirror currents of the same value I_0 to flow in the drains of the second and third transistor 424 and 426. The resistors 430, 432, and 434 are of the same value so that when the small voltage signal V_{sense} is zero, the mirror current flowing across the resistors 432 and 434 are mirrors of the reference current I_0. The gates of transistors 422, 424, and 426 only see one V_{gs}. The differential voltage V_{sense} is translated down to the same value on drain nodes of transistors 424 and 426 by a shift of their common mode voltage. When the small voltage signal V_{sense} is zero, the common mode voltage is equal to V_{hv}. Then the two resistors ~~and~~ shift down the common mode voltage by an amount equal to I_0R_2 or I_0R_3 as second and third transistors 424 and 426 try to match the current mirror at first transistor 422. In a preferred embodiment, the resistance value of resistors ~~422, 424, and 426~~ <u>430, 432, and 434</u> are 25 kΩ. V_{dd} equals 3.3 volts, Vref equals ~~to~~ 1.65 volts (= ½ · Vref). Op-amp resistors 442 and 444 are 250 kΩ.

The paragraph beginning on p. 7, ln. 4 (corresponding to replaced page 8, line 25):

Since the mirror currents flow<u>ing</u> into the inverting and non-inverting terminals of the op-amp 440 are the same, the op-amp 440 thus rejects these common-mode currents. As a result, V_{out} equals ~~to~~ Vref. Because R_5/R_2 equals ~~to~~ R_4/R_3, the output of the op-amp 440 equals ~~to~~ R_4/R_3 $(V^+ - V^-)$ = Vref wherein V^+ is the voltage at the non-inverting terminal and V^- is the voltage at the inverting terminal of the op-amp 440.

The paragraph beginning on p. 8, ln. 4 (corresponding to replaced page 10, line 6):

RC low pass filters (502-512), which are optionally provided, filter out high frequency components. High frequency signals can be potentially damaging to the transistors 422, 424, and 426. One terminal of a sixth resistor 502 is coupled to the high voltage line 412 and the other terminal is coupled to a first capacitor 504 and to the

first resistor 430. The second terminal of the first capacitor 504 is coupled to ground. Similarly, a first terminal of a seventh resistor 506 is coupled to the first terminal of the sensing resistor 414; a second terminal is coupled to a second capacitor 508. The second terminal of the capacitor 508 is coupled to ground, forming an RC low pass filter with the seventh resistor 506. The other terminal of the sensing resistor 414 is coupled to an eighth resistor 510. A third capacitor 512 is coupled to the other terminal of the resistor 510 and to the third resistor 434. The second terminal of the capacitor 512 is coupled to ground. The low pass filters, formed by R_6/C_1, R_7/C_2, and R_8/C_3 pairs, ~~filters~~ filter out unwanted high frequency components that are potentially damaging to the transistors 422, 424, and 426. If the filters are left off, resistors 430, 432 and 434 typically have 25 kΩ values. If the optional filters are provided, typical resistance values for the resistors 502, 508 and 512 have capacitance values of about 10pF. These optional low pass filters do not affect the overall basic operation of the IC as described above.